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DISCUSSION AND CORRESPONDENCE  
THE SONG OF THE GRASSHOPPER SPARROW  
(AMMODRAMUS SAVANNARUM  
AUSTRALIS MAYNARD)

For many years I have been interested in the song of the grasshopper sparrow. This sparrow appears to be fairly common around Washington, D. C. During the early part of the summer of 1916 I frequently heard its peculiar, insect-like, lisping notes, for the bird is more often heard than seen. One male, however, almost invariably perched upon a certain cedar tree in the National Cemetery, near the McClellan Gate, to deliver its dainty, high-pitched it-tip-i-ts-e-e-e-e-e-e-e-e. This particular bird sang in this manner for many mornings, always singing from the same favorite tree.

For many years I was familiar with this field sparrow around my home town, Oxford, Mass., and have often heard delivered a more complete song than the one usually described by practically all observers and ornithologists. The usual song, it-tip-i-ts-e-e-e-e-e-e-e-e, frequently terminated with a most remarkable series of faint, rapidly uttered, wild, ecstatic, flowing, warbler-like notes—an exuberant chippety-chippety-chippety, continued for six or eight seconds. This last performance appears to have been a sort of passion song and is remotely like a tiny edition of the oven bird's passionate outburst as it mounts into the air above the woodlands at night. This more complete song is not as commonly heard as the lisping monotone and I have never yet heard it elsewhere than in New England. I feel, however, that this wonderful little twittering rhapsody is a part of its true song, at least in some portions of its range.

In the literature referring to the habits of this sparrow I find only two references to this variation in its song. In "Birds of New York," Memoir 12, Vol. 2, by Elon Howard Eaton, an excellent description of the song by Gerald Thayer is cited. Thayer interprets the usual song as "sit-tit-ts-e-e-e-e-e-e-e-e." He does not regard this as the true song of the grasshopper sparrow, however. The true song which he heard was a "long, rambling

twitter," uttered in a tone similar to that of the insect-like notes given above, although not as loud, and continuing as long as 10 to 12 seconds. Eaton says:

This rolling twitter is uttered when the male and female are flying together over the meadows or seated near each other.

L. A. Fuertes has also heard this more complete song of the grasshopper sparrow and likens it to the twittering song of the prairie horned-lark heard at a considerable distance.

H. A. ALLARD

WASHINGTON, D. C.

DECORATIVE AND PICTORIAL ART

TO THE EDITOR OF SCIENCE: As an artist, I was interested in the quotation on art, used as an apt illustration in the interesting article, "Education after the War," by Messrs. Franklin and MacNutt, in SCIENCE of December 15. The argument is based on a misconception of the relative values of decorative and pictorial art; a misconception which is entirely modern. The Greek or medieval potter or weaver would have been much surprised if, when he was decorating a jar or a fabric with conventional forms, he had been told that his art was less "living" than that of the picture maker. Pictorial art is no higher or more alive than decorative art; it is simply a different expression of the artist's feeling for the beautiful.

The artist who designed the angel, probably in mosaic, illustrated in the article, desired to fill a given space with a symmetrical arrangement of line, form and color, which would be pleasing to the eye. As he was decorating a church, this arrangement took the form, or rather became the symbol, of an angel. He pointed the thumbs because the pattern was thus improved and he put red spots on the hands because he wanted some bright color in that particular place. (Though for the matter of that, I know of no data which warrant our concluding that angels haven't pointed thumbs or red spots on their palms!) If he had been decorating a banquet hall, he would have used some symbol of conviviality, such as grapes, or a figure of Bacchus, or whatever symbol was best adapted

to his purpose, *i. e.*, filling a given space with ornament pleasing to the eye.

Decorative art is limited by space, material, etc., and its interest often consists in the artist's effort to use these limitations; while the comparative freedom of pictorial art often causes it to degenerate into imitation—which, of course, is not art at all.

As the technic of art is properly a science, these remarks may not be entirely out of place.

MARGARET ARMSTRONG

#### THE PRESERVATION OF RECORDS

TO THE EDITOR OF SCIENCE: On reading the article on "Our Duty to the Future," by Professor C. E. Vail, in the December number of the *Scientific Monthly*, it occurred to me that we have at hand, available without special expense, better means of leaving permanent records for the future than any of our predecessors. Practically all printing is done from electrotypes; these electrotypes are made of metals that are not readily corroded by atmospheric action and under proper storage conditions would be very permanent.

In the production of practically all great books, or other records, engravings, etc., electrotypes are used. After serving their purpose in printing the edition many times they are but slightly worn and could be stored compactly in fire-proof and earthquake-proof, dry vaults. Sets of electrotypes, such as those employed in printing the *Encyclopedia Britannica*, and other reference works, would provide for future generations a considerable knowledge of almost everything of importance pertaining to this era.

Generally speaking, the preservation of records in this way would cost no more than the bullion price of the metal involved in the plates, as otherwise the plates would be remelted and the metal used over.

JOHN S. WRIGHT

#### SCIENTIFIC BOOKS

*How to know the Mosses.* By ELIZABETH MARIE DUNHAM. Boston: Houghton, Mifflin Co., 1916. 287 pages, illustrated. \$1.25.  
This little book is intended as "a popular

guide to the mosses of the Northeastern United States" according to its subtitle or, as the cover states, "This handbook of mosses—the first intended for use without a microscope—throws open a new and fascinating field of study to the amateur botanist and nature lover. Keys to 80 genera and descriptions of over 150 species are given." In view of the limitations, and considering how difficult it is to really know the mosses thoroughly, Mrs. Dunham's conscientious effort to introduce a few of our most abundant and easily recognized genera and species to a wider acquaintance will certainly lengthen the season of out-door pleasures and interests for those who love nature at all times of the year! For "the mosses and lichens love the damp shade and the wet frosty season when other plants fade." To acquire even a bowing acquaintance with 80 out of the 200 genera represented in our flora and grow to recognize 150 species out of nearly 3,000, is to learn to have eyes that see and appreciate the subtler beauties of form and color.

The drawings in the text and the full-page illustrations will be found helpful and with the exception of a few indispensable technical terms the book is free from pedantry and unnecessary verbiage.

E. G. BRITTON

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#### SPECIAL ARTICLES

##### THE EFFECT OF FINENESS OF DIVISION OF PULVERIZED LIMESTONE ON THE YIELD OF CRIMSON CLOVER AND LIME REQUIREMENT OF SOILS

THE practical significance which attaches to studies in the application of lime to soils is responsible for experimentation with pulverized limestone of varying degrees of fineness. Frear<sup>1</sup> cites, together with his own experiments, the comparatively few investigations pertaining to this problem. It has been stated by some authorities that limestone passing a 10-mesh sieve is satisfactory for field practise, while others have advocated material passing a 60-mesh sieve, some claiming that even finer pulverization is to be preferred. The following experiments were planned in 1914 to throw

<sup>1</sup> Frear, W., "Sour Soils and Liming," Dept. Agr. Penn. Bul. 261, 1915.